5.4 HYDROLOGY AND WATER QUALITY

5.4.1 Introduction and Methodology

FSEIR #01-01 analyzed potential impacts to hydrology and drainage for the proposed project site, as well as adjacent and nearby parcels referred to as the Woods, Vistas, and Panhandle. The proposed project site is within the Vistas Parcel.

FSEIR #01-01 concluded that construction and development of the Woods and Vistas could cause an increase in the amount of runoff and have potentially significant hydrologic impact on downstream drainage facilities during 100- year, 50- year, 25- year, 10- year, and 5- year storm events. In addition, FSEIR #01-01 determined that the proposed diversion from the Vistas neighborhood may exceed the capacity of the existing Olympic Parkway storm drain system, which would constitute a significant impact. Mitigation was required that directed all future runoff to the Salt Creek outfalls.

FSEIR #01-01 indicated that potential groundwater contamination from pesticides used during previous agricultural activities would not be considered a significant impact based on a representative Phase I Environmental Assessment that found no trace of agrochemicals in soil samples. Mitigation measures were included in FSEIR #01-01 to lessen all potential impacts to groundwater to a less than significant level.

Previous analysis for construction related impacts to water quality, presented the FSEIR #01-01, indicated that impairment to receiving waters resulting from conventional construction techniques would occur with development of the Woods and Vistas neighborhoods. These impacts could be reduced to a less than significant level through the use of best management practices (BMPs).

FSEIR #01-01 recognized the potentially significant impact to water quality from increased runoff that has the ability to carry pollutants into nearby water resources, particularly the Otay Reservoirs. The project analyzed under FSEIR #01-01 was designed to divert runoff away from the reservoirs, with the exception of the manufactured slopes along the east side of the development. FSEIR #01-01 proposed to use potable water for irrigation, revegetate with drought tolerant plants to reduce water usage, and restrict the use of pesticides, herbicides, and fertilizers to reduce impacts to below a significant level. Based on the runoff diversion plan and BMPs proposed to reduce pollutant load, FSEIR #01-01 concluded that water quality in the Otay Reservoirs would not be adversely affected by the Woods and Vistas project.

This section provides a summary of the existing hydrology and water quality conditions, potential impacts to water quality associated with construction and operation of the proposed project, and mitigation measures to reduce potentially significant impacts.

The potential impacts of the Vistas was analyzed in a drainage study (Rick Engineering Company, 2002) to estimate runoff from the site. This information was used to analyze potential impacts to the City of Chula Vista's existing storm water conveyance system. The study was based on a previously proposed commercial development and later modified to more closely represent multi-family residential complexes, a recreation center, and associated driveways and roads. A revised report dated August 5, 2005 was prepared by Rick Engineering that estimated runoff for the proposed project. The August 5, 2005 Rick Engineering Report is included as *Appendix C* to this EIR.

The water quality technical report prepared by P&D Consultants (*Final Water Quality Technical Report for EastLake III Senior Housing Project*, October 21, 2005) was used to determine effects the proposed project may have on water resources. The January 13, 2006 *Storm Water Management Modification for EastLake III Senior Housing Project Letter Report* prepared by P&D Planning documents water quality provisions for the proposed optional, temporary construction access road. In addition, the August 5, 2005 data provided by Rick Engineering was taken into consideration in conducting this analysis. A copy of the letter report and water quality technical report can be found in *Appendix C* to this document.

Existing hydrologic conditions were obtained from the Water Quality Control Plan for the San Diego Basin (California Regional Water Quality Control Board, 1994), information provided in FSEIR #01-01, and hydrology, drainage, and geotechnical reports prepared for the project.

5.4.2 Existing Conditions

Regulatory Environment

Several local, state, and federal regulations govern discharges associated with construction and post-construction storm water runoff to protect water quality of receiving waters. The following is a summary of the regulatory framework that has been established to protect water resources.

Federal

Federal Clean Water Act. Increasing public awareness and concern for controlling water pollution led to enactment of the Federal Water Pollution Control Act Amendments of 1972. As amended in 1977, this law became commonly known as the Clean Water Act. The Act

established basic guidelines for regulating discharges of pollutants into the waters of the United States. The Clean Water Act requires that states adopt water quality standards to protect public health, enhance the quality of water resources, and ensure implementation of the Act.

Section 401. Section 401 of the Clean Water Act requires an applicant for a federal permit, such as the construction or operation of a facility that may result in the discharge of a pollutant, to obtain certification of those activities from the state in which the discharge originates. This process is known as the Water Quality Certification for a project. For projects in San Diego, the San Diego Regional Water Quality Control Board (RWQCB) issues Section 401 permits.

Section 402. Section 402 of the Clean Water Act established the National Pollution Discharge Elimination System (NPDES) to control water pollution by regulating point sources that discharge pollutants into waters of the United States. In the state of California, the Environmental Protection Agency (EPA) has authorized the State Water Resource Control Board permitting authority to implement the NPDES program. In general, the State Water Resource Control Board issues two baseline general permits—one for industrial discharges and one for construction activities. The Phase II Rule that became final on December 8, 1999, expanded the existing NPDES program to address storm water discharges from construction sites that disturb land equal to or greater than one acre.

Section 404. Section 404 of the Clean Water Act established a permitting program to regulate the discharge of dredged or filled material into waters of the United States. The definition of waters of the United States includes wetlands adjacent to national waters. This permitting program is administered by the U.S. Army Corps of Engineers and enforced by the EPA.

Section 303(d). Under section 303(d) of the Clean Water Act, the State Water Resource Control Board is required to develop a list of water quality limited segments for jurisdictional waters of the United States. The waters on the list do not meet water quality standards, and therefore the Regional Water Quality Control Board was required to establish priority rankings and develop action plans, referred to as Total Maximum Daily Loads (TMDL), to improve water quality. The EPA approved the San Diego Regional Water Quality Control Board's 303(d) list of Water Quality Limited Segments in July 2003. The list includes pollutants causing impairment to receiving waters or, in some cases, the condition leading to impairment. The project is within the Otay Watershed which is not currently listed on the 303(d) list of Water Quality Limited Segments.

State

Porter-Cologne Water Quality Control Act. The Porter-Cologne Act, also known as Division 7 of the California Water Code, is the basic water quality control law for California. The goal of the Porter-Cologne Act was to create a regulatory program to protect water quality and beneficial uses of the state's waters. As such, the State and Regional Boards were established to implement and enforce the Clean Water Act and state adopted water quality control plans.

The State Water Resource Control Board is responsible for issuing storm water permits in accordance with the NPDES program. For projects disturbing one or more acres of land, the applicant must file a Notice of Intent for coverage under the General Permit for Storm Water Discharges Associated with Construction Activity (General Permit) and prepare a Storm Water Pollution Prevention Plan (SWPPP) that specifies Best Management Practices (BMPs) to prevent pollutants from contacting storm water and procedures to control erosion and sedimentation.

San Diego County falls within the jurisdiction of the Regional Water Quality Control Board (Region 9). Each Regional Water Quality Control Board is responsible for water quality control planning within their region, often in the form of a basin plan. The Regional Water Quality Control Board is also responsible for implementing the provisions of the General Permit, including reviewing SWPPPs and monitoring reports, conducting compliance inspections, and taking enforcement actions.

Local

Chula Vista Municipal Storm Water Permit. The City of Chula Vista, County of San Diego, Port of San Diego, and 17 other cities in the region were issued a NPDES Municipal Storm Water Permit on February 21, 2001 by the San Diego Regional Water Quality Control Board. The permit requires the development and implementation of BMPs in development planning and construction of private and public development projects. Development projects are also required to include BMPs to reduce pollutant discharges from the project site in the permanent design. BMPs associated with the final design are described in the Model Standard Urban Storm Water Mitigation Plan (SUSMP). The City of Chula Vista's SUSMP requirements, dated November 19, 2002, requires City review of project plans as part of the development plan approval process for discretionary projects, and prior to issuing permits for ministerial projects. In addition, projects subject to priority project requirements must prepare and submit a Water Quality Technical Report specific to the project area.

City of San Diego Source Water Protection Guidelines. The City of San Diego Water Department has written source water protection guidelines for new developments located within

San Diego County watersheds that drain into drinking water reservoirs (see *Appendix C*). The guidelines were designed so that project planners can incorporate BMPs that protect or improve the quality of runoff draining into the reservoirs. The Lower Otay Reservoir located to the east of the proposed project site is one of the seven reservoirs governed by the guidelines. All development within the Otay Reservoir area will conform to the City of San Diego's Source Water Protection Guidelines for New Development.

Water Resources

Surface Water

The San Diego Region has thirteen principle stream systems originating in the western highlands that flow to the Pacific Ocean. Most of the streams of the San Diego Region are intermittent in character having both perennial and ephemeral components due to the rainfall pattern and the development of surface water impoundments.

The project is located entirely within the Otay River Watershed, Savage Hydrologic Subarea (910.31); however, the project site now drains by way of the City's storm water conveyance system to Salt Creek, which is in the Otay Valley Hydrologic Area. There are no surface waterbodies within the project limits. The nearest surface water to the project site is the Lower Otay Reservoir located approximately 0.1 mile to the east. Salt Creek is located approximately 0.5 miles west of the project site (see *Figure 5.4-1, Surface Waterbodies*). Beneficial uses of the Otay Reservoir include agricultural supply, non-contact water recreation, warm fresh water habitat, wildlife habitat, and rare, threatened, and endangered species habitat. The beneficial uses of Salt Creek include agriculture, recreational (non-contact), warm freshwater habitat, and wildlife habitat. In addition, potential beneficial uses include industrial and recreation (contact) (Regional Water Quality Control Board, 1994).

The project site is characterized by a 19.6 acre graded pad with vegetated slopes around the western boundary. The site is virtually denuded of vegetation from recent grading, however, straw wattles have been installed at frequent intervals to reduce the velocity of sheet flow over the site. Runoff primarily drains across the flat terrain from the southeast to the northwest to Olympic Parkway. The site is located on the top of a slope; therefore, the amount of run-off entering the site from surrounding areas is minimal. There is a sedimentation pond located near the northwest corner of the site that discharges to a 42-inch pipe and into the City's storm water conveyance system in Olympic Parkway which, ultimately discharges to Salt Creek (P&D Consultants, 2005).

FIGURE 5.4-1: SURFACE WATERBODIES

Groundwater

Groundwater is water found below the land surface in aquifers, pore spaces, unconsolidated sediments, and as soil moisture. Groundwater flows to the surface naturally at springs and seeps and can pool in depressions on the land surface. It may also be tapped artificially by the digging of wells for beneficial uses such as drinking water and irrigation. The depth, or groundwater level, is dependent on numerous factors, but includes type and depth of bedrock and proximity to streams, wetlands, and other waterbodies. Subsurface explorations at the proposed project site were conducted to a depth of 19.5 feet below the surface. No seepage or groundwater was observed at these depths during the geotechnical investigation (Geotechnics Incorporated, 2005). However, changes in rainfall, irrigation practices, or site drainage patterns could produce seepage or locally perched groundwater within the site.

Water Quality and Drainage

Water quality refers to the effect of natural and human activities on the composition of water. Water quality is expressed in terms of measurable physical and chemical qualities that can be degraded by urban runoff, illicit discharges, and even planned water use. It is generally agreed that urban runoff transported by municipal storm water conveyance systems is one of the principal causes of water quality problems in most urban areas. Storm water that accumulates on impervious surfaces, such as parking lots, roof tops, and streets, drains directly and indirectly to waters of the United States.

The City of Chula Vista's storm water conveyance system is separate from the sanitary sewer system and therefore does not receive any treatment prior to being discharged into streams, bays, and the ocean. The primary pollutants of concern in urban runoff are sediments, nutrients, heavy metals, organic compounds, trash and debris, oils, bacteria, and pesticides. Construction-related pollutants include sediment, concrete, paints and solvents, and hazardous materials associated with operation and maintenance of heavy equipment.

Flooding

A 100-year flood event is a flood that has a 1-percent chance of being equaled or exceeded in any given year. The 100-year flood is the standard used by most federal and state agencies and the National Flood Insurance Program as the standard for floodplain management. The project area is not located within a 100-year flood zone. Refer to *Figure 5.4-1, Surface Waterbodies*, for the nearest flood zone.

5.4.3 Thresholds of Significance

According to the significance criteria included in Appendix G of the CEQA guidelines, the proposed project would have a significant impact on water resources and water quality if it:

Would the project:

1) Violate any water quality standards or waste discharge requirements?
2) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?
3) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?
4) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?
5) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources or polluted runoff?
6) Otherwise substantially degrade water quality?
7) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?
8) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?
9) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?
10) Be exposed to inundation by seiche, tsunami or mudflow?

5.4.4 Environmental Impacts

Would the project violate any water quality standards or waste discharge requirements?

Construction

Construction of the proposed project has the potential to impact surface water quality due to increased runoff and sediment transport from the site. Soil compaction required for the construction of the parking lots and building foundations would likely decrease infiltration rates and soil permeability, resulting in increased runoff from the site when compared to pre-construction conditions. Short-term water quality impacts may occur to nearby water resources, including storm drains, from sediment-laden runoff from project areas. *Table 5.4-1 Potential Impacts to Water Quality* lists potential impacts to water quality for each phase of construction.

TABLE 5.4-1
Potential Impacts to Water Quality

Construction Phase	Impact	Potential Threat To Water Quality
Grading	Exposed soils	Grading would increase the erosion potential of onsite soils which could lead to offsite sediment transport. In addition, grading during project construction could result in temporary spoil stockpiles that would be vulnerable to wind erosion. This impact is potentially significant.
	Soil transport from vehicles and equipment	Soil from disturbed areas could be tracked onto paved roads during egress from the site by vehicles and equipment, particularly during inclement weather. Soil on paved roads could be washed into storm drains during storm events. Sediment transport from the site could have adverse impacts to water quality which would be a potentially significant impact.
	Fugitive dust	Fugitive dust during construction is considered a form of erosion and has the potential to be deposited in sensitive resources. Without adequate dust abatement, fugitive dust could potentially result in significant impacts.
	Increased runoff	Increased runoff due to compacted soils during grading would increase the potential for offsite sedimentation. In addition to sediment, runoff could potentially carry pollutants. Runoff carrying sediment and other pollutants could potentially be significant.
	Inadvertent release of hazardous materials	Grading, grubbing, and trenching activities could result in the release of hydraulic oil, diesel fuel, motor oil, and/or radiator fluid used in operation of heavy equipment. If released, these products could potentially result in significant impacts on water.
Building/Utilities Construction	Cement washout	Cement used for building foundation, sidewalks, and other construction related activities could have an adverse impact to water quality due to high pH if it is released or transported to a water resource.
	Hazardous materials	Paints, solvents, lubricants, oils, and other products used in construction could potentially impact water quality if they are not stored and handled properly. If released, these products could potentially contaminate surface and ground water.
	Trash and debris	Trash and debris exposed to rain and runoff could potentially increase chemical concentrations of water resources as well as block storm drain inlets.

Since the project would disturb more than one acre, the applicant must file a Notice of Intent with the SWRCB and obtain a General Construction Activity Storm Water Permit, pursuant to the NPDES regulations established under the Clean Water Act. This permit requires preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP), which is intended to prevent degradation of surface and ground waters during the grading and construction process. Without such protections, impacts to water quality during construction would be significant.

The impacts associated with construction, as listed in *Table 5.4-1* above, are all considered short-term. Best Management Practices proposed in *Section 5.4.5* would ensure that impacts to water quality would be reduced to less than significant levels through measures intended to control erosion and sedimentation within the perimeter of the site, and to effectively manage hazardous materials.

The Lower Otay Reservoir is a sensitive resource that requires site-specific BMPs to ensure water quality efforts are not compromised. The site is currently graded to drain away from the reservoir to a detention basin located in the northwest corner of the site, which transfers flow to Salt Creek via the City's storm water conveyance system. Therefore, there is no potential impact to the reservoir from runoff from the pad site in its current configuration. The entry fill slope below the north and east side of the pad currently drain easterly towards the reservoir. However, the project proposes to irrigate with potable water and landscape with drought tolerant plants to minimize runoff from the slope. All runoff will comply with the City of San Diego Source Water Protection Guidelines (2004). A concrete brow ditch located near the base of the slope intercepts flow and directs it to the City's storm water conveyance system (P&D Consultants, 2005).

Construction could have a significant impact on water quality if grading or subsequent construction activities result in an unauthorized discharge (i.e. dewatering or improper use of a water truck) from the site to the eastern fill slope. However the brow ditch at the base of the slope, would provide a safeguard for runoff that could potentially occur from the site. Additionally, mitigation measures have been included to ensure that the current site drainage away from the Otay Reservoir is maintained for the duration of construction.

Operation

It is assumed upon completion that the proposed project would not result in the use of chemicals other than those typically associated with residential uses. Routine use of the proposed project following the completion of construction would have the potential to contribute to the degradation of nearby surface waters by generating urban runoff. Approximately 10 of the 19.6 acre site would consist of an impervious surface (P&D Consultants, 2005).

Impervious surfaces convey surface runoff that would otherwise infiltrate into the ground in permeable areas. Runoff from the parking lot, sidewalks, and landscaping could carry pollutants such as bacteria, oil and grease, sediment, nutrients and heavy metals to the City's storm drain system. Impacts from impervious surfaces and associated runoff during operation of the facility could result in potentially significant impacts to surface waters. BMPs intended to reduce runoff from the site and minimize the amount of sediment and pollutants that enter the City's storm water conveyance system would be required to comply with the Standard Urban Storm Water Mitigation Plan (SUSMP) including but not limited to site design BMPs, source control BMPs, and treatment BMPs which include bio swales, stabilized entrance/exit mechanisms, street sweeping, spill cleanup, waste management, use of oil/water filters, grass mowing and irrigation, animal/vector control, and trash and debris removal. Specific BMPs are discussed in detail in the *Final Water Quality Technical Report* (See *Appendix C*). Implementation of the measures outlined in Appendix C would ensure that potential impacts to water quality are less than significant.

***Optional Construction Road*:** Although the roadway will be covered with decomposed granite which is a pervious surface, drainage of the slope adjacent to the southern edge of the project would likely change during use of the temporary construction access roadway. As indicated in the January 13, 2006 Stormwater Management Modification for the EastLake III Senior Housing Project letter (prepared by P&D Consultants), in order to ensure that stormwater runoff from the construction road would not result in significant impacts, protection and control will include an additional stabilized construction entrance/exit (minimum of 50-foot length) for the proposed road, slope stabilization for disturbed slopes and erosion and sediment control for the roadway surface. Runoff from the roadway would be captured via the brow ditch at the base of the hillside that will ensure that water is conveyed to the Olympic Parkway storm drains instead of allowed to drain into the Lower Otay Reservoir.

Similar to the proposed project, this project feature may impact surface water quality due to increased runoff and sediment transport from the site. Short-term water quality impacts related to sediment and pollutant-laden runoff from the project area would potentially impact receiver water bodies. In order to reduce these potential impacts, mitigation, in the form of BMPs outlined in the Final Water Quality Technical Report and January 13, 2006 letter prepared by P&D Consultants, included in *Appendix C*, would be required. Further, similar regulatory requirements of the proposed project would occur for this optional feature (including addressing this project feature in the SWPPP).

This project feature would be removed once construction has been completed. The re-grading and revegetation effort for the proposed project would return the southern slope area to its

original form. Pre-construction drainage patterns would be restored, therefore operational impacts would not occur.

***Optional Pedestrian Trail*:** Due to the limited site preparation necessary to establish this optional project feature, runoff and sediment transportation from this specific area would be minimal and less than significant. Similar to the proposed project, this project feature may impact surface water quality due to increased runoff and sediment transport from the site during construction. Short-term water quality impacts related to sediment and pollutant-laden runoff from the project area would potentially impact receiver water bodies. In order to reduce these potential impacts, mitigation, in the form of BMPs, (i.e., installation of temporary erosion and sediment control devices) would be required. Similar regulatory requirements of the proposed project would apply to this optional feature (including addressing this project feature in the SWPPP).

Due to the minimal soil disturbance needed to construct this facility coupled by the fact that the trail will be covered with decomposed granite which allows for water infiltration, existing hillside drainage patterns would remain unchanged once the trail is constructed. Therefore, operational hydrology and water quality impacts would be less than significant.

Would the project substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

The proposed project is not anticipated to significantly alter groundwater resources. As stated in the geotechnical investigation, proposed excavations are located above the anticipated water table. Furthermore, no existing wells were identified within the site boundaries. Therefore, the project would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge.

Optional Construction Road: This optional feature would not involve cutting into the existing slope south of the project site. Therefore groundwater contact during construction of the temporary road is not expected. Further, due to the pervious nature of the roadway, water infiltration into this immediate area would not be precluded, therefore any groundwater recharge occurring within the southern slope area would not be modified as a result of this project feature.

In summary, impacts related to groundwater contact and infiltration would be less than significant.

***Optional Pedestrian Trail*:** This optional feature would not involve cutting into the existing hillside between the project site and OTC. Therefore, groundwater contact during construction of this facility is not expected. Further, due to the pervious nature of the trail, water infiltration into this immediate area would not be precluded, therefore any groundwater recharge occurring within this hillside area would not be modified as a result of this project feature. In summary, impacts related to groundwater contact and infiltration would be less than significant.

Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?

Based on the *Final Water Quality Technical Report* (included in *Appendix C*) for the proposed project, approximately 10 acres of the 19.6 acre site would consist of an impervious surface following the completion of construction. Sidewalks, rooftops, asphalt driveways, and parking areas make up hardscape that replaces previously permeable ground. Impervious surfaces, such as those mentioned above, intercept rainfall and convey flow that would otherwise naturally percolate into the soil. The introduction of permanent impervious surfaces would result in a net increase in runoff from the site when compared to pre-construction conditions. In order to adequately capture site run-off, existing onsite drainage patterns would be altered. Alteration of onsite drainage would not involve redirection of a stream or river, but instead would modify the existing detention basin system. Similar to the existing condition, flows would continue to be directed to drainage facilities within Olympic Parkway and would therefore avoid erosion problems on- or off-site. Therefore, a less than significant impact would occur.

***Optional Construction Road*:** Although constructed of pervious surface material such as decomposed granite, drainage patterns on the southern slope would be temporarily altered as a result of this project feature. In order to reduce risks of potential siltation on or off-site, drainage BMPs, such as proposed for the project (i.e., additional stabilized structures, entrance/exit treatment for the proposed road [minimum of 50-foot length], slope stabilization for disturbed slopes and erosion and sediment control for the roadway surface) , would be applicable to this project feature as well. All drainage would be directed to the existing brow ditch located at the base of the slope along the eastern edge of the project which will ensure that the drainage is diverted to the Olympic Parkway storm drain system rather than allowed to flow into Lower Otay Reservoir. Therefore a less than significant impact would occur.

***Optional Pedestrian Trail*:** During construction, minimal soil disturbance would occur, therefore temporary drainage alteration would be less than significant. Due to the proposed contour grading associated with this project feature, impacts to hillside drainage patterns would be less than significant.

Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

Based on the *Final Water Quality Technical Report* (included in *Appendix C*) for the proposed project, approximately 10 acres of the 19.6 acre site would consist of an impervious surface following the completion of construction. Sidewalks, rooftops, asphalt driveways, and parking areas make up hardscape that replaces previously permeable ground. Impervious surfaces, such as those mentioned above, intercept rainfall and convey flow that would otherwise naturally percolate into the soil. The introduction of permanent impervious surfaces would result in a net increase in runoff from the site when compared to pre-construction conditions. In order to adequately capture site run-off, existing onsite drainage patterns would be altered. Alteration of onsite drainage would not involve redirection of a stream or river, but instead would modify the existing drainage system which would be designed to hold water of a severe rain event. Flows would continue to be directed to drainage facilities within Olympic Parkway and would therefore avoid flooding problems on- or off-site. Therefore, a less than significant impact would occur.

***Optional Construction Road*:** Although constructed of pervious surface material such as decomposed granite, drainage patterns on the southern slope would be temporarily altered as a result of this project feature. All drainage would be directed to the existing brow ditch located at the base of the slope along the eastern edge of the project which will ensure that the drainage is diverted to the Olympic Parkway storm drain system. This system was designed to adequately convey drainage from the project site toward the established storm drain systems which would prevent flooding on or offsite. Therefore a less than significant impact with regard to flooding would occur.

***Optional Pedestrian Trail**:* During construction, minimal soil disturbance would occur, therefore temporary drainage alteration would be less than significant. Due to the proposed contour grading associated with this project feature, impacts to hillside drainage patterns would be less than significant and flooding either on or offsite is therefore not anticipated to occur.

Would the project create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources or polluted runoff?

Based on a 50-year storm event, the surface flow for the proposed project was calculated to be 58.9 cubic feet per second (cfs). This is less than the Commercial-Tourist land use previously proposed for the site which yielded a discharge of 59.1 cfs (Rick Engineering, August 2005). The receiving storm drain system within Olympic Parkway was designed to accommodate the previously calculated 59.1 cfs flow quantity. Therefore, the proposed project would not create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems (P&D, October 21, 2005), no impact would occur. *Table 5.4-2, Summary of Storm Water Runoff Calculations,* provides a summary of the estimated flow conditions.

TABLE 5.4-2
Summary of Storm Water Runoff Calculations

Outfall Contribution	Drainage Area (acres)[1]	Q_{50} (Cubic Feet Per Second)*		
		Existing[2]	Design Flow**	Post-Construction
Total	20.2	24.3	59.1	58.9

Source: Final Water Quality Technical Report, Revised October 21, 2005. P&D Consultants.
Notes:
* Calculations based on the Drainage Study prepared by Rick Engineering (August 5, 2005), modified for runoff coefficient 0.75.
** The existing storm water conveyance system in Olympic Parkway was designed to handle higher flow from a commercial project on the site (design flow runoff coefficient of 0.85) (P&D, October 21, 2005).
Q_{50} Flow for a 50-year storm event

See discussion under significance criteria above for water quality impacts.

***Optional Construction Road*:** Due to the temporary nature of the proposed project, significant impacts to the City's storm drain conveyance system would not occur as a result of temporary access road construction. While drainage patterns on the southern access slope would be slightly modified and runoff directed to the brow ditch at the base of the slope to the east of the project site, impacts would be less than significant due to the temporary nature of this feature. Finally, potential water quality impacts would occur if pollutant-laden runoff from this facility reaches storm drain facilities. Water quality BMPs, such as the use of various mulches to stabilize soil, erosion control blankets, silt fencing, street sweeping, and vehicle equipment cleaning would be applicable during construction to control pollutant-laden runoff from the proposed roadway.

***Optional Pedestrian Trail*:** Due to the minimal cut/fill necessary for construction of this facility, onsite drainage pattern alterations during construction would be less than significant. Once constructed, this project feature would follow the existing contours of the hillside, therefore impacts to onsite drainage patterns would not result. Further, due to the fact that this facility would be constructed with decomposed granite which would allow for water infiltration, drainage patterns present within the trail area would not be significantly altered. Once constructed, existing hillside drainage patterns would persist.

Would the project otherwise substantially degrade water quality?

As discussed above, significant impacts to water quality associated with the Otay Reservoir could occur if runoff from the site entered the waterbody. Also, the trail would not be paved and would stay as a pervious surface. However, the drainage plan for the site would intercept all flow within the project area and direct it to the City's storm water conveyance system that drains to Salt Creek. In order to avoid potential impacts to Lower Otay Reservoir water, mitigation measures, in the form of BMPs have been included.

According to the City of San Diego Source Water Protection Guidelines (2004), the project site would be categorized as Tier 3 project which warrants the highest consideration for source water quality protection. Tier 3 projects are required to implement project design BMP's, source control BMP's, treatment control BMP's and pre-treatment and post-treatment BMPs according to Decision Guides A-D of the Water Protection Guidelines. According to Decision Guide C: Treatment Control BMPs, BMPs to consider for the Senior Housing project include treatment trains, extended detention basins, retention basins, sand filters, dry wells, swales, filter strips, bioretention, infiltration basin, trench and porous pavement. The project includes detention facilities, retention basins, oil/water filters and infiltration facilities, as described in *Section 5.4.6, Mitigation Measures*.

***Optional Construction Road*:** Similar to the proposed project, impacts to water quality associated with the Otay Reservoir could occur if runoff from the temporary construction access road entered the waterbody. However, similar to the proposed project, all runoff from this facility would be directed to the brow ditch at the base of the hillside to the east of the building pad for eventual conveyance to the Olympic Parkway/Salt Creek storm drain conveyance system. Therefore a less than significant impact would occur.

Optional Pedestrian Trail: Construction of this optional project feature would be minimal due to lack of cut/fill activity. Any temporary, construction-related drainage interruption which could result in altered sediment or pollutant composition in the runoff would be minimal and not likely reach the Lower Otay Reservoir downstream.

The proposed trail would mirror the existing hillside contours which would minimize alteration of existing drainage. Further, due to the pervious nature of the trail feature, water could percolate through the trail structure which would eliminate runoff toward the Lower Otay Reservoir. This project feature's minimal impact area and site design would result in less than significant impacts to water quality.

Would the project place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

The site is located approximately 565 feet above mean sea level and outside of the 100-year flood zone. Due to the project's location outside of a mapped flood zone, flooding of the project site is not likely to occur, therefore impacts would be considered less than significant.

Optional Construction Road: The proposed construction access road would not be located within a 100-year flood hazard area. Due to this project feature's location outside of a mapped flood zone, flooding of this project feature area is not likely to occur, therefore impacts would be considered less than significant.

Optional Pedestrian Trail: Similar to the proposed project, the optional trail would not be located within a 100-year flood hazard area. Due to this project feature's location outside of a mapped flood zone, flooding of this project feature area is not likely to occur, therefore impacts would be considered less than significant.

Would the project place within a 100-year flood hazard area structures which would impede or redirect flood flows?

As stated in the discussion under Threshold #6, above, the site is located approximately 565 feet above mean sea level and outside of the 100-year flood zone of both the Lower Otay Reservoir and Salt Creek. Therefore, the project would not redirect 100-year flood flows.

Optional Construction Road: Similar to the proposed project, this project feature would range from 570 to 500 feet above mean sea level and outside of the 100-year flood zone. Therefore this project feature would not redirect 100-year flood flows.

Optional Pedestrian Trail: Similar to the proposed project, this project feature would be located at approximately 575 feet above sea level and outside of the 100-year flood zone. Therefore this project feature would not redirect 100-year flood flows.

Would the project expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

The project site is located outside of a dam inundation zone, including the upper and lower Otay Reservoir hazard areas (San Diego County Flood Control, personal communication, September 2005). Therefore, the project wouldn't subject future residents or structures to dam failure hazards.

Optional Construction Road: Similar to the proposed project site, the construction access road would be located outside of the dam inundation zone associated with the Upper and Lower Otay Reservoirs. Therefore, the project wouldn't subject future residents or structures to dam failure hazards.

Optional Pedestrian Trail: Similar to the proposed project site, the pedestrian trail would be located outside of the dam inundation zone associated with the Otay Reservoirs. Therefore, the project wouldn't subject future residents or structures to dam failure hazards.

Would the project be exposed to inundation by seiche, tsunami or mudflow?

As stated in *Section 5.3,* tsunamis, seiches, and earthquake induced flooding are not expected to occur on the project site given its distance inland and elevation above the Otay Reservoirs. Therefore, impacts associate with such events would be less than significant.

Optional Construction Road: Similar to the proposed project, these geotechnical hazards would be less than significant due to the road's location inland and above the elevation of the Otay Reservoirs. Therefore impacts associated with this proposed project feature would be less than significant.

Optional Pedestrian Trail: Similar to the proposed project, these geotechnical hazards would be less than significant due to the trail's location inland and above the elevation of the Otay Reservoirs. Therefore impacts associated with this proposed project feature would be less than significant.

5.4.5 Level of Significance Prior to Mitigation

Water quality impacts resulting from construction and operational activities would be significant prior to mitigation.

5.4.6 Mitigation Measures

The following mitigation measures are intended to comply with the City's water quality requirements and reduce potential impacts to a less than significant level.

5.4-a Prior to approval of a grading permit the Applicant shall obtain coverage under the State Water Resources Control Board (SWRCB) NPDES General Permit No. CAS000002, Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction Activity. In accordance with said Permit, a Storm Water Pollution Prevention Plan (SWPPP) and a Monitoring Program Plan shall be developed and implemented concurrent with the commencement of grading activities. The SWPPP shall specify both construction and post-construction structural and non-structural pollution prevention measures. The SWPPP shall also address operation and maintenance of post-construction pollution prevention measures, including short-term and long-term funding sources and the party or parties that will be responsible for the implementation of said measures.

A complete and accurate Notice-of-Intent (NOI) shall be filed with the SWRCB. A copy of the acknowledgement from the SWRCB that a NOI has been received for this project shall be filed with the City of Chula Vista when received. Further, a copy of the completed NOI from the SWRCB showing the Permit Number for this project shall be filed with the City of Chula Vista when received.

5.4-b Prior to approval of grading and construction plans, the Applicant shall demonstrate to the satisfaction of the City Engineer compliance with all of the applicable provisions of the Municipal Code and the City of Chula Vista SUSMP. The Applicant shall incorporate into the project planning and design an effective combination of site design, source control, and treatment control post-construction BMPs and provide all necessary studies and reports demonstrating compliance with the applicable regulations and standards. Post-construction BMPs shall be identified and implemented as to abate identified pollutants of concern to the maximum extent practicable standard described in the City of Chula Vista SUSMP.

5.4-c Prior to issuance of a grading permit for any area of the project (including offsite areas) draining towards the Lower Otay Reservoir, the applicant shall:

1) Obtain the approval of the City of Chula Vista and all other applicable agencies for any proposed structural drainage runoff detention and/or diversion facilities within the Otay Lakes Watershed.

2) Obtain the approval of the City of Chula Vista and all other applicable agencies of all operational and maintenance agreements associated with any proposed structural drainage runoff detention and/or diversion facilities within the Otay Lakes Watershed.

5.4-d Prior to approval of the grading plan, the Applicant shall verify that surface drainage has been designed to collect and discharge runoff into natural stream channels or drainage structures. In order to avoid indirect impacts to the Lower Otay Reservoir, fertilizers, herbicides, and pesticides shall not be applied to the manufactured slopes along the northern property of the property. Potable water shall be used for irrigation. All drainage systems shall be designed in accordance with the City's Engineering Standards and to the City of San Diego's Source Water Protection Guidelines for New Developments (2004).

5.4-e The applicant shall design surface and subsurface drainage to preclude ponding outside of designated areas, as well as flow down slopes or over disturbed areas.

5.4-f Prior to the approval of a grading permit, the Applicant shall verify that runoff diversion facilities (e.g., inlet pipes and brow ditches) have been be used to preclude runoff flow down graded slopes. Drainage terraces for slopes in excess of 40 feet in vertical height shall only be required for stabilization purposes. Slopes in excess of 40 feet in height may not require terraces provided that slope-specific analysis demonstrates that such measures are not needed in order to achieve the intent of the City's grading ordinance. Energy-dissipating structures (e.g., detention ponds, riprap, or drop structures) shall be used at storm drain outlets, drainage crossings, and/or downstream of all culverts, pipe outlets, and brow ditches to reduce velocity and prevent erosion. The applicant shall demonstrate compliance in grading plans prior to issuance of a grading permit.

Prior to issuance of the grading permit for any site in the drainage area, the Applicant shall demonstrate that the proposed detention facilities would reduce 50-year post-development peak flows to equal to or less than pre-development conditions. The proposed onsite detention facilities shall be designed to ensure that there is no increase in downstream (i.e., south of Olympic Parkway) velocities in Salt Creek. For areas with the greatest potential for groundwater seepage, impacts could be reduced to a less than significant level through installation of subsurface drains as determined by the Soils Engineer and approved by the City Engineer. Implementation of these measures is the responsibility of the applicant.

Prior to the start of grading activities, the brow ditch located at the base of the slope between the Lower Otay Reservoir and the project site shall be inspected and sediment that could cause runoff to breach the ditch shall be removed. The brow ditch shall be inspected after each 0.5 inch.

5.4-g Prior to approval of the final map, and/or building permits (as determined by the City Engineer), the Applicant shall submit a maintenance program for the proposed post-construction BMPs and all private drainage facilities within common development areas to the satisfaction of the City Engineer. The maintenance program shall include, but not be limited to: **(1)** a manual describing the maintenance activities of said facilities, **(2)** an estimate of the cost of such maintenance activities, and **(3)** a funding mechanism for financing the maintenance program. In addition, the Developer shall enter into a Maintenance Agreement with the City to ensure the maintenance and operation of said facilities.

5.4-h Regular maintenance of the Greenbelt and Community trails shall be the responsibility of the Eastlake III HOA, depending on designation, to minimize the potential for erosion into Lower Otay Reservoir. Prior to the approval of the TM, the applicant shall submit a Landscape Responsibility map to identify funding for all areas within the project.

5.4-i The following urban runoff control measures shall be shown as notes on the Tentative Map. These measures shall be made a condition of the Tentative Map and shall be implemented on the final grading and improvement plans. Implementation of these measures is the responsibility of the applicant.

1) Per the Clean Water Act, BMPs to control pollutants and sediment from entering storm water runoff are required for the project area. Source control BMPs via landscaping of all slopes and street rights-of-way shall be provided to prevent erosion. Any other applicable source control or BMPs which may be implemented on a city-wide basis in conjunction with the City's Municipal NPDES permit shall be incorporated into the specific plan. The size, capacity, and location of any other pollution control devices which would be used to capture urban pollutants onsite will be determined as part of the project-specific drainage studies prior to the approval of future subdivision maps.

2) The City's Department of Planning and Building shall verify that the mitigation measures are conditions for the approval of the tentative map and that they are implemented on the grading plans for the project.

5.4-j Prior to the issuance of any building permit, the applicant shall demonstrate to the satisfaction of the Director of Planning and Building that hazardous materials shall not be stored along the eastern edge of the site. All hazardous materials shall be stored within secondary containment capable of holding 150 percent of the largest container. Hazardous materials shall be stored in a secure area that can be locked during non-working hours. This will help prevent any unintended hazardous material spills which could impact quality of runoff water from the site.

5.4-k Silt fence or a similar approved sediment barrier shall be installed along the eastern perimeter of the project site, or as directed by a qualified erosion control specialist, to prevent sediment transport into the Lower Otay Reservoir. Spoil stockpiles shall be stored at least 20 feet from the perimeter of the site. A qualified monitor shall inspect all erosion and sediment control devices onsite prior to anticipated storm events, during extended storm events, and after each storm event to ensure that the structures are functioning properly. Inspection logs shall be kept onsite and submitted to the City upon request.

5.4.7 Significance of Impacts after Mitigation

All potential impacts to water quality and hydrology would be reduced to a level below significant with the proposed mitigation measures. BMPs intended to minimize erosion and control sedimentation, as well as requirements of the City's Municipal Storm Water Permit and the project's SWPPP to prevent hazardous materials from contacting storm water runoff, would ensure mitigation is implemented in accordance with federal, state, and local regulations.